CROP PRODUCTION NEWS

Volume 33, No. 9 — September 13, 2011

CROPS

Editor's Comments

By Sean Miller, PAg, Crops Branch

Harvest is moving ahead across the province, with most progress having been made in the southwest. The Saskatchewan Ministry of Agriculture's Sept. 8 Crop Report indicates that 32 per cent of the 2011 crop has now been combined and an additional 34 per cent is swathed or ready to straight-combine. The five-year provincial average for this time of year is 32 per cent combined and an additional 31 per cent swathed or ready to straight-combine. For more information, visit www.agriculture.gov.sk.ca/Crop-Report.

If you are applying a crop protection product, please REMEMBER TO FOLLOW THE PRE-HARVEST INTERVAL GUIDELINES. Refer to the product label or the product information in the *2011 Guide to Crop Protection* for more information on specific pre-harvest intervals.

Our next and last edition of the 2011 Crop Production News will be published at the end of September. Watch for the notice in your email inbox.

Good luck with harvest!

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ✪

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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Saskatchewan Ministry of Agriculture

Crop Protection Laboratory Update

By Philip Northover, AAg, Supervisor, Crop Protection Laboratory

Sample submissions have decreased as the end of the growing season nears. Still, a number of samples with multiple disorders have made for some challenging diagnoses. The hot dry weather has caused problems related to poor root systems and root rots, but nothing out of the ordinary.

Figure 1: Spores of *Entomosporium mespili*, the cause of Entomosporium leaf spot of saskatoons. Named for the insect-like appearance, loosely translated "Ento" = insects and "sporium" = spores.
Source: Saskatchewan Agriculture

The list below indicates the diseases or disorders that have been identified in the past two weeks, with most diagnosed multiple times.

Field Crops:
Barley: Fusarium head blight
Canaryseed: Fusarium head blight, root rot
Canola: Herbicide injury
Durum: Herbicide injury
Lentils: Herbicide injury, poor root development
Wheat: Fusarium head blight, Stagonospora leaf and blume blotch, Wheat streak mosaic virus

Trees:
Manitoba Maple: Moisture stress, iron chlorosis
Aspen: Marsonnina leaf spot
American Elm: Dutch elm disease samples: 97 have been diagnosed in the past week, 29 with the disease, 68 without the disease.

Horticulture:
Dogwood (alternate leaved): leaf miner/skeletonizer damage
Saskatoons: Entomosporium leaf blight (*Entomosporium mespili*)
Tomato: Poor root development

Weed Submissions:
Prostrate knotweed (*Polygonum aviculaire*)
Bushy knotweed (*Polygonum ramosissimum*)
Poverty sumpweed (*Iva axillaris)*
Willowherb (*Epilobium spp.*)
Figwort (Scrophulariaceae family) ☼

Agriculture Knowledge Centre Update

By Brent Flaten, PAg, Integrated Pest Management Specialist

Inquiries during the past couple of weeks have turned to fall issues, including pre-harvest, post-harvest and fall crop seeding issues. There continues to be inquiries on weeds, diseases, insects, termination of perennial forage stands and fall fertilizer application.

Regarding insects, last week we were still receiving calls on the imported cabbage worm moths. As stated in Scott Hartley's article in the Aug. 25 edition of the Crop Production News, the moths usually do not cause enough damage to canola crops to worry about spraying. Bertha armyworm questions on late-seeded canola have declined since last week. As always, follow pre-harvest intervals with any pesticide applications. Some producers have been asking about wireworm control for next year. Seed treatment for suppression of wireworms is the only option. Unfortunately, these seed treatments do not kill the wireworms, so their populations continue to increase over time.

We have also been receiving questions on controlling grain storage insects, especially in grain left over from the 2010 crop. Refer to the following document on grain storage insect control: www.agriculture.gov.sk.ca/Default.aspx?DN=5105b40a-724a-445c-9fc4-a3fce1c1f501. Be cautious about binning high temperature grain harvested during hot weather. It is important to cool grain through aeration. Oilseeds are the crop most at risk of spoilage under these conditions.

Harvest questions include crop staging for swathing and the use of glyphosate pre-harvest versus Reglone for crop desiccation or weed control. In most cases, producers are wondering how to hurry the maturity of late-seeded crops such as durum, wheat or chickpeas. As a reminder, note that Reglone is not registered on cereals and unregistered use could endanger markets. Glyphosate is not a desiccant due to its slow dry down of plants. The driver for deciding to use glyphosate pre-harvest should be perennial weed control rather than crop desiccation. Applying glyphosate too early will increase glyphosate residues in the seed. Reglone will only work quickly if the crop is already ripening on its own.

Post-harvest control of perennial weeds such as dandelions, quackgrass and Canada thistle has been a common inquiry due to the lack of frost in the weather forecast. Post-harvest glyphosate applications on these weeds work well at this time of year as long as the plant is healthy. Especially with Canada thistle, glyphosate control is improved significantly if there are some new leaves growing on the plant since the harvest operation. Post-harvest herbicide applications can provide good control of newly emerged winter annuals which are usually easier to kill in the fall, and give some breathing room for pre-seed burnoff timing next spring. However, note that some tank-mix partners with glyphosate, such as 2,4-D may affect what you can seed next spring. For example, canola is sensitive to fall-applied 2,4-D.

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Agriculture Knowledge Centre Update
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Forage questions continue to include perennial stand termination with either glyphosate alone or with 2,4-D. With shorter days at this time of year, glyphosate will provide better control by moving down into the alfalfa roots along with food reserves. Again, if adding 2,4-D amine for enhanced control, be aware of potential re-cropping issues with sensitive crops such as canola.

Regarding seeding winter wheat, remember to avoid a green bridge between immature spring wheat that is still green and green winter wheat seedlings. When this green bridge occurs, there is higher risk of a disease called wheat streak mosaic being transferred from the spring wheat to winter wheat by mites. To lessen the risk of this disease, allow at least a two-week break after spring wheat ripening before seeding winter wheat. The biggest concern this year will be late-seeded wheat that is slow to mature.

Soil-related questions have included fall fertilization with winter wheat and fall rye. If the field is not saturated either this fall or next spring, all of the nitrogen can be applied at the time of seeding. However, if saturated soils are expected, increasing the potential of denitrification losses of the nitrate nitrogen, then a split fall and spring application of nitrogen may be beneficial. ☼

Agriculture Knowledge Centre

Hours: 8 a.m. to 5 p.m. Monday to Friday
Phone: 1-866-457-2377

Got a question?
E-mail: aginfo@gov.sk.ca
Want to submit your question online?
Go to our http://www.agriculture.gov.sk.ca/ask_saskatchewan_agriculture form page.

What is Willowherb? Why is it in my chem-fallow field?

By Clark Brenzil, PAg, Provincial Specialist, Weed Control

There have been an increasing number of questions asked about a plant that seems to be able to survive the application of glyphosate in chem-fallow fields. The plants that are most often the culprits are willowherb (*Epilobium sp.*).

Figure 2: Willowherb
Source: Saskatchewan Agriculture.

There are several species of willowherb (*Epilobium* sp.) that are native to the Canadian Prairies. The most commonly identified species at the Saskatchewan Agriculture Crop Protection Laboratory is sticky or fringed willowherb (*E. ciliatum*). Fringed willowherb is the common name recognized in the U.S.A (USDA, NRCS. 2011) and sticky willowherb is recognized in Canada (Darbishire, Favereau and Murray, 2000). *Budd's Flora of the Canadian Prairie Provinces* refers to this species as 'northern willowherb'.

Sticky willowherb is an erect plant that grows from 30 to 100 centimetres tall, with opposite leaves that are roughly spear shaped and have fine serrations along the margins. 'Parts of four' is often used to describe the flowering parts of willowherbs, since all reproductive parts are in multiples of four, including the chambers of the seed pod. The flowers of sticky willowherb are small (six millimetres across), four petals that are generally pale pink, and are borne on the tip of the long ovary/seed pod. Pods up to five centimetres long produce many small seeds that have several tufts of white hairs that allow the seed to spread in the wind.

Marsh willowherb (*E. palustre*) is very similar to sticky willowherb but is less common and, as the name indicates, prefers wet areas. Marsh willowherb differs from sticky willowherb in that the leaves are not serrated and its maximum height is only 60 centimetres. Bog willowherb (*E. leptophyllum*) is considered by *Budd's Flora of the Canadian Prairie Provinces* to be the same as marsh willowherb, but is recognized as a separate species by the USDA. Bog willowherb has more branching at the top of the plant than marsh willowherb. There is also an introduced and invasive hairy willowherb (*E. hirsutum*), also known as 'Codlins and Cream', that has yet to be reported on the Canadian Prairies. Willowherb is also closely related to fireweed.

A very high proportion of requests for identification or information on control over the last several years have come from chem-fallow fields. The issue is being raised even more than usual given the higher-than-normal number of acres of fallow and wet fields over the last two years.

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What is Willowherb? Why is it in my chem-fallow field?
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When the rare occurrence of willowherb growing in crop fields is reported, it is usually always associated with wet soil conditions, for example along the boundary of a slough.

Willowherb's place in the environment is to be an early succession plant that temporarily covers over and protects areas that have experienced some type of catastrophic loss of vegetation such as fire or flood. Chem-fallow, from the perspective of nature, is a close approximation of these catastrophic events that trigger the growth of willowherb. Infrequent concerns raised in crop fields, suggest that willowherb is not very competitive; this also fits with its typical role in nature.

Figure 3: Sprayed willowherb (left) and unsprayed willowherb (right)
Source: Saskatchewan Agriculture.

Willowherb also appears to be very tolerant to glyphosate, as is the rest of the *Onagraceae* or evening primrose family. Reports from chem-fallow fields suggest that the willowherb remains largely untouched by fallow herbicide applications, even when repeated throughout the year. There are likely several other contributing factors to willowherb's survival in fallow in addition to a natural glyphosate tolerance. Sticky willowherb is not a very large or robust plant, so many producers may not immediately realize that it is a perennial, and apply relatively low rates of glyphosate on the initial pass in chem-fallow. Once it is realized that the initial glyphosate treatment has not successfully controlled the willowherb, the initial application has already damaged the willowherb enough that it is stressed and unsuitable as a target for future applications of glyphosate or alternative herbicide options. Several producers have reported that they have applied up to 720 grams acid equivalent per acre in their first application on fallow, specifically to target willowherb, and it still survived.

Timing of the first fallow application may be another factor in willowherb tolerance to fallow herbicides. Early in the growing season, the sugar in perennial plants is typically moving from root to shoot. Perennials are best targeted for control from mid-August to late September while sugar flow is from leaves toward the roots. Glyphosate applied at this time is actively moved to the root with the sugars.

There has been little research done on the activity of other fallow herbicides on willowherb. As a result, few recommendations are available on how to control it in fallow. Because it is infrequently reported as a problem in fields with seeded crops, intensive management of willowherb may not warrant the additional cost of herbicide alternatives or mixes, even if they are available. **(Continued on page 7)**

What is Willowherb? Why is it in my chem-fallow field?
(Continued from page 6)

Willowherb has been an evolving weed management concern for producers over the last several years, but the extremely wet weather in several regions of the province over the last two years has brought more attention on this plant.

Looman, J.; Best, K. F.; 1979. *Budd's Flora of the Canadian Prairie Provinces*. Research Branch, Agriculture and Agri-Food Canada, Ottawa, ON. Canada, Publ. 1662.

Darbyshire, S.J.; Favreau, M. and Murray, M. 2000. *Common and scientific names of weeds in Canada*. Research Branch, Agriculture and Agri-Food Canada, Ottawa, ON. Canada, Publ. 1397/B.

USDA, NRCS. 2011. *The PLANTS Database* (http://plants.usda.gov, 1 September 2011). National Plant Data Team, Greensboro, NC 27401-4901 USA.

Management of Stored Grains

By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pests

Effective management of stored grain is always an important aspect in production systems. There is always the potential of green or moist material going into storage facilities. Therefore, in order to maintain optimum value of the commodity, efficient monitoring and management procedures are critical to avoid issues related to grain heating, mould and insect infestations.

The Canadian Grain Commission has noted that insect infestations are most commonly associated with residual grain particles or dust in or around storage facilities. Remove vegetation or spilled grain that attracts insect or rodent pests around storage facilities. Start with clean grain handling equipment, including augers and trucks as well as bins. Sweep or vacuum to remove any residue present before any commodity is put into storage. If cereal grains are to be stored, the bin, including cracks and crevices, can be treated with an insecticide such as malathion. **However, it is important to note that you must wait at least six months before storing canola in facilities treated with malathion.** Oilseeds will absorb sufficient quantity of the insecticide to exceed minimum residue limits (MRLs) allowed for export to some countries.

Preferably grain should be dry before putting into storage but it may be necessary to cool and dry the grain once it is in the bin. For long-term storage, grain should be cooled to below 15C as soon as possible. Drying and cooling the grain will prevent heating and fungal growth. Cool temperatures also prevent insect growth and reproduction. Certain insects (fungus feeders) do not feed on the grain itself, but on fungal growth on the seed. Although not considered primary insect pests in stored grain, the presence of these insects will affect marketing of the commodity.

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Management of Stored Grain
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For more information, contact:
Agriculture Knowledge Centre toll free in Saskatchewan at 1-866-457-2377.

For more detailed information please refer to the Saskatchewan Agriculture fact sheet:
www.agriculture.gov.sk.ca/adx/aspx/adxGetMedia.aspx?DocID=2127,343,185,81,1,Documents&MediaID=6001&Filename=Insects+and+Mould+in+Stored+Grain+-+Printer+Friendly.pdf

Also refer to the Canadian Grain Commission website for information on managing stored grain maintaining quality and managing insect infestations:
www.grainscanada.gc.ca/storage-entrepose/mqsgm-mgqge-eng.htm ☼

2011 Dutch Elm Disease Summary

By Marla Ives, Dutch Elm Disease Technician

The first sample for Dutch Elm Disease testing arrived on June 21, which was a slower start than the 2010 season. Samples came into the Crop Protection Laboratory regularly from that point on, but were most frequently submitted near the end of July and throughout August. To date, 276 samples have been submitted, nine are still in the process of being cultured, 118 samples have been confirmed positive for Dutch Elm Disease and the remaining 149 samples did not have the Dutch Elm Disease fungus present.

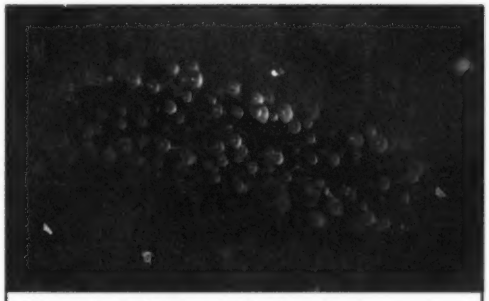

Figure 4: *Ophiostoma ulmi* in culture (the cause of Dutch elm disease). Source: Saskatchewan Agriculture.

Within the City of Regina, five trees tested positive for Dutch Elm Disease and numerous trees in the Regina buffer zone also tested positive. The City of Moose Jaw continues to battle the disease. They had 11 infected trees in and around the city. Estevan lost three trees, while Tisdale and Carlyle had two removed. The major hot spots continue to be the Fort Qu'Appelle and Indian Head regions. The Resort Village of B-Say-Tah, very close to Fort Qu'Appelle, had 31 positive samples alone. Saskatchewan is home to many elms, so it is imperative to understand what can be done to prevent the disease.

Being aware of the symptoms of Dutch Elm Disease is essential to prevention. Once the disease is confirmed the tree can be removed to avoid further infestation of surrounding elms.

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2011 Dutch Elm Disease Summary
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Figure 5: Elm bark beetle.
Source: Saskatchewan Agriculture.

Obvious symptoms to watch for include: wilting green and yellow leaves in the summer, curling brown leaves near fall and brown streaking under the bark of tree branches. Another key to prevention is to obey the pruning ban from April 1 to Aug. 31 because the elm bark beetle, which transports the fungus, is attracted to the scent of freshly cut wood. It is also important to never transport or store elm wood because it is an ideal breeding place for the beetle. ✿

Direct-Seeding Alfalfa into Forage Sod

By Michel Tremblay PAg, Provincial Specialist, Forage Crops

Periodic reestablishment of forage stands containing introduced species is required to maintain productivity. Traditional forage stand reestablishment involves intensive tillage to eliminate the existing vegetation and to create a seedbed suitable for seeding the subsequent forage stand. Sometimes annual species are grown on the field following breaking to allow for in-crop chemical control of remaining vegetation and to provide an opportunity to apply fertilizer. Old forage fields are often rough. Annual cropping for two years can assist in levelling the field and eliminating existing sod. However, excessive tillage can damage fragile soils often found under forage stands and negate any benefits the forage crop has had on soil quality. Reestablishment of forage stands can also result in the interruption of forage supply.

Many producers would like to reduce the time, soil damage and costs associated with using tillage to eliminate old forage stands when preparing to establish a new sward. Herbicides can be used to eliminate existing vegetation, and air seeders can be used to place seed into dead forage sod. However, not all fields may be suitable for this technique. If the field has high populations of difficult-to-control weeds, is excessively rough, has poor soil fertility, has high rodent populations, or has disease or insect infestations that will affect the following forage stand, it may not be suitable for direct-seeding of forages, and should be annually cropped to address problems that may exist in the field.

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Direct Seeding Alfalfa into Forage Sod
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Figure 6: Precise seed placement, covering and packing are critical elements of success.
Source: Michel Tremblay

A critical element contributing to the success of direct-seeding alfalfa into forage sod is thorough control of existing vegetation. Control of existing forage plants as well as weedy species such as Kentucky bluegrass, foxtail barley, quackgrass and dandelion, is necessary to eliminate competition to emerging seedlings. Research has indicated that spraying late in the growing season is most effective at eliminating perennial species. Spraying too early in the fall will result in recovery and reduced control the following spring. Application of herbicides can occur as late as late September; however, frosts below 4C will reduce herbicide efficacy. If control of broadleaf and grass plants is desired, a mix of glyphosate and a broadleaf herbicide like 2,4-D will provide the most economical control. Pay careful attention the residual action of any herbicides applied to avoid damage to the following crop.

Vegetation control should be evaluated the following spring. In most situations, vegetation will recover from a single fall-applied herbicide treatment, which will result in unacceptable levels of undesirable vegetation in the subsequent forage stand. A second application of herbicide the following spring will provide further control, and make seeding into the sod viable.

If alfalfa is seeded into sod that contained alfalfa, autotoxicity may be a problem. Autotoxicity occurs when a plant inhibits the growth of a neighbouring plant of the same species. Suppression of growth in alfalfa seedlings is due to the detrimental effects of phenolic compounds that accumulate in the soil from alfalfa plant parts. Phenolic compounds break down in the soil. Rate of breakdown is influenced by rainfall and soil texture. Wetter and more heavily textured soils are less prone to accumulation of phenols. Research examining the persistence of autotoxicity following alfalfa, and safe intervals for recropping alfalfa are variable. Generally, phenols degrade more rapidly when alfalfa fields are tilled rather than sprayed. Recommendations for an appropriate wait period before planting alfalfa into alfalfa sod vary from two weeks to one year. In Saskatchewan, elimination of sod in the fall, and seeding the following spring should allow for dissipation of phenols, in most cases.

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Direct Seeding Alfalfa into Forage Sod
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Figure 7: Alfalfa seedlings emerging in herbicide controlled forage sod.
Source: Michel Tremblay

An over-winter period following initial herbicide treatment allows the sod to die and decay, making the seedbed more suitable for seeding the following spring. Sod must be sufficiently degraded to allow for consistent action from the seeder opener, and the surface to be friable enough to allow for soil to flow back into the furrow to cover the seed. All good seeding techniques should be used during establishment, as in conventional seeding of forages. Seeders should have openers that deliver consistent soil coverage of seed and effective packing. Seed placement and seed coverage and packing are critical elements to the success of direct-seeding alfalfa and other forage species into forage sod.

In order to maximize the success of seeding alfalfa or other forage species into chemically killed forage sod, assess the suitability of the field, including soil fertility and timely fall and spring herbicide treatments. As well, careful seeding, paying particular attention to seed placement and packing, is necessary. Although forages, particularly alfalfa due to its vigorous establishment characteristics, can be successfully seeded into forage sod terminated using herbicides, not all fields may be suitable for this technique. The practice has a significant element of "art" associated with it, as well as "science".☼

The ***Crop Production News*** is a publication of the
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